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OICW Non-Lethal Munition

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Pre-Milestone A Program

Program: Objective Individual Combat Weapon Non Lethal (OICW NL) Munition

Concept:

• Exploit the ability of the OICW to airburst munitions at a precise location in space to emplace or employ NL concepts.

OICW NL Risks and Challenges

- Potential lethal injurious effects from projectile airburst and parasitic mass
- 20 mm Volume limitations on payload effectiveness
- Fuzing development (MEMS S&A)
- Burst point precision

Key Participants

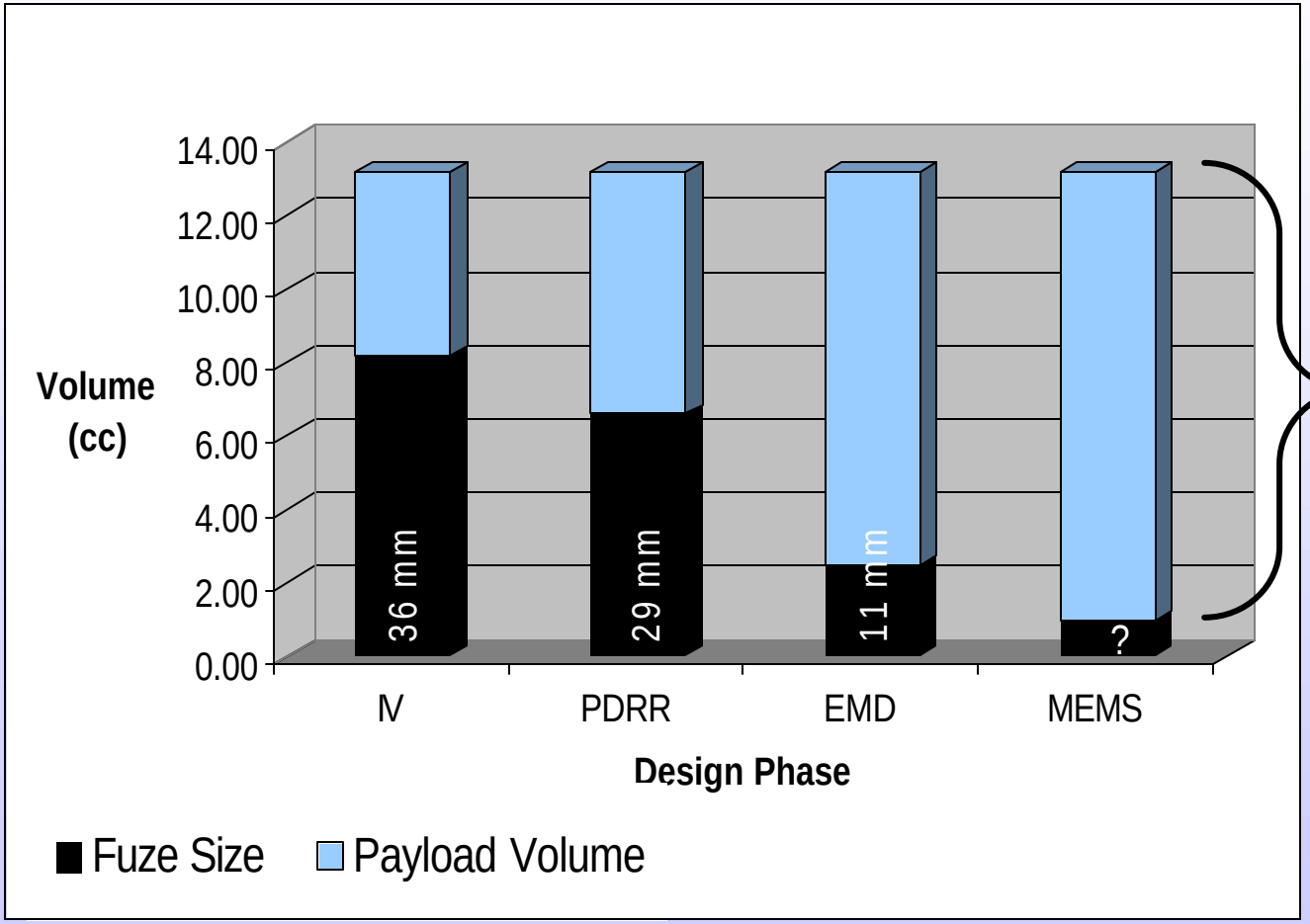
Lab/Office	POC	Phone
• TACOM-ARDEC Projectile Design	F. Dindl	(973) 724-6761
• SBCCOM/ECBC Modeling & Simulation, Payload Experiments	L. Bickford	(410) 436-2231
• Oak Ridge NL Frangible Materials Development	Dr. Lowden	(865) 576-2769
• PM OICW OICW Interface	T. Hartmann	(973) 724-8515
• Alliant Techsystems Parts and Services	Maple Grove, MN	
• JNLWD Quantico, VA Sponsor, Requirements Generation	M. Grussendorf	(703) 784-2646

Concepts carried forward

- Integrated Proximity Sensor w/ Reverse Thrust Concept
(not pursued because of multiple technologies required for development)

- Controlled Residual Kinetic Energy Concept
(selected concept)

OICW Fuze vs. Payload Volume



NL Agent over 2X current amount.

Incapacitation area maximized

More effective over harsher atmospheric conditions

Program Documentation

Document Title	Approved	
• Pre-Phase A Exit Criteria (MS A Entrance Criteria)	26 Apr 00	JNLWD RIG
• OICW NL Preliminary Legal Review	06 Jul 01	
• OICW Approved ORD	24 Feb 00, Draft Rev 24 Mar 02	
• SCG for JNLW Program	Apr 98, Draft Rev May 01	
• SCG for OICW	Aug 00, Draft Rev 22 Mar 02	

OICW Non-Lethal Munition Milestone A Entrance Criteria

•Operational Input

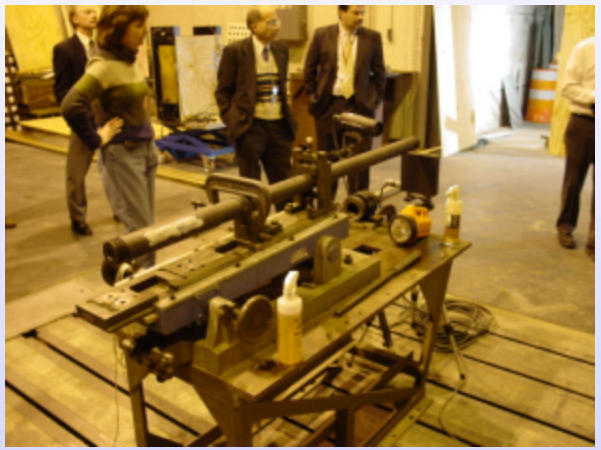
	Criteria	Threshold	Goal
	Dispense Payload:	250m	5m-1000m
	Technology Readiness Level (TRL)	4	5

TRL 4 – Component and or breadboard validation in a laboratory environment

TRL 5 – Component and or breadboard validation in a relevant environment

OICW NL Technical Demonstration

- Ballistic test conducted 12 Feb 02
- Attended by SOCOM, Army, AF, JNLWD representatives
- Fired several cartridges to function @ 250 m
- Witness panel to initiate projectile
- A surrogate fuzing system was utilized
- Target (rigid foam) 5 m beyond witness panel



Results

- Demonstrated ranged initiation and disperse simulant (smoke pellets)
- All parasitic mass non-lethal
- Projectile velocity reduced to non-lethal levels after airburst
  - Projectile recovered laying between witness panel and target
  - No perforation of target
  - No projectile rupture

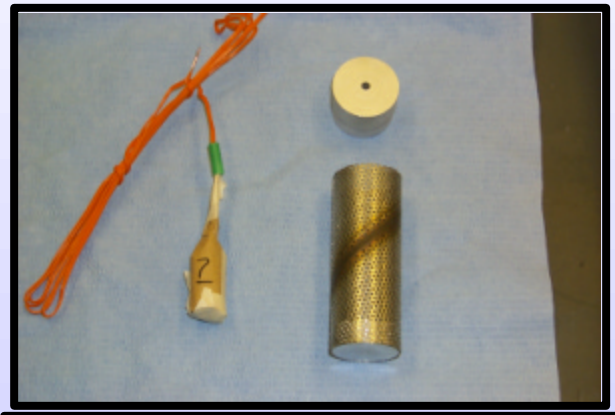
OICW NL Payload Tests

Payload Test set up (Jan 02)

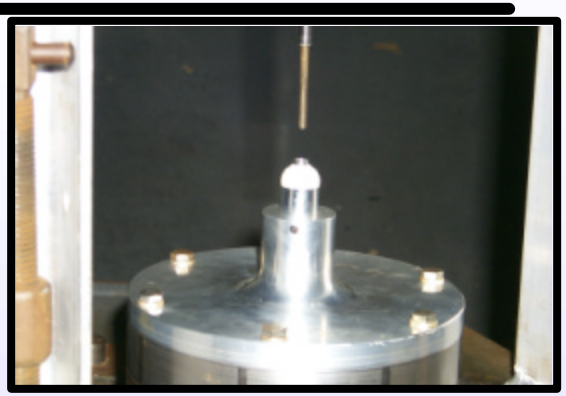
- Pyrotechnic CS – 3/16 in, 1/4 in pellets – 5-6 gms, starter mix, electric match, kraft paper
- CS initiated using various burst scenarios (0, 250, 500, 750, 1000 fps)
- 3 filter readings, 35 liter/minute, mixing fan

Results

- Max average airborne CS - .16%
- Pellets not optimized
- Airspeed may have prevented CS dissemination
- Below calibration limits of analytical procedure used



OICW NL Payload Tests



Payload Test set up (19 Apr 02)

- Pyro CS ground 3/16-in pellets (3.2g)
- Bulk CS1 (1.6g)
- Custom spin fixture (10,400 rpm) to simulate projectile in flight spin rate
- 3 filter readings, 35 liter/min, mixing fan
- More realistic expulsion conditions

Results

- Pyro CS: three round average, 0.09g airborne (measured) yielding 7% airborne CS
- Bulk CS1: three round average, 0.51g airborne (measured) yielding 32% airborne CS

CS Payload Summary

- Pressed/Cast CS - HE ruled out as dissemination technique
  - Required standoff was believed to be high
- Pyro/CS - Poor performer
  - 60 % pyro required
  - Pellets not optimized
- Bulk CS1 - Best approach to date
  - Need to increase CS packing density to 8.4 gm
  - Need to maximize airborne yield – 32% to 70%

OICW NL Human Effects

• The preliminary focus is on CS effect and overcoming the KE of projectile near target.

• Working with Human Effects Center of Excellence (HECOE), Brooks AFB, TX to evaluate effects on the target – both effectiveness and risk to the target's health and safety

• Provided 20 vs. 40mm Payload Analysis to HECOE - May 01

• Submitted Target Human Effects Evaluation Plan (THEEP) - 10 Jan 02

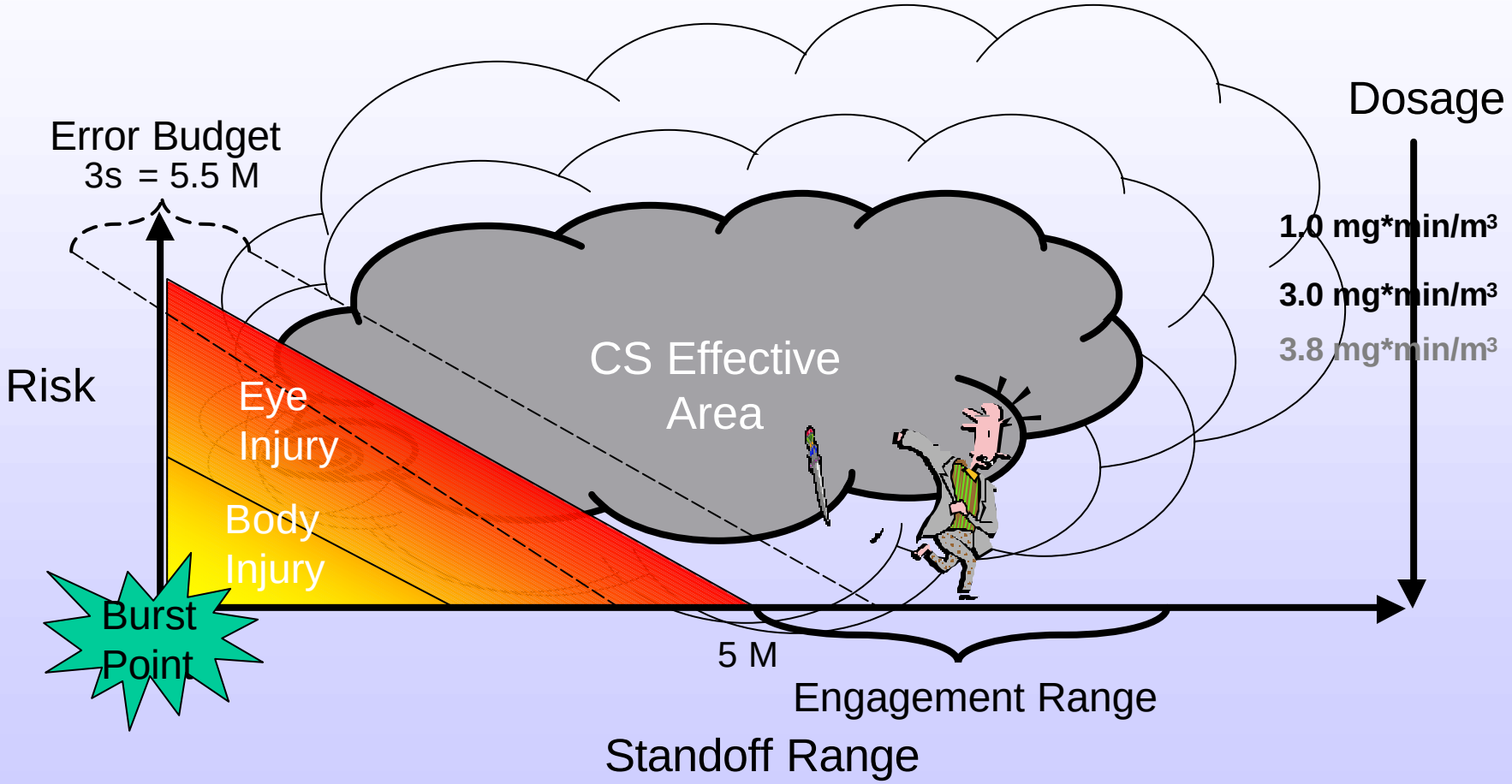
• Initial Human Effect Review Board (HERB) meeting scheduled - 11 Jul 02

OICW NL Human Effects

Target Human Effects Evaluation Plan (THEEP)

- RCA (CS irritant) effectiveness against the intended: Target Response
  - CS Dosage - CS incapacitation metric needs further definition
  - CS route of entry - ocular (eyes), cutaneous (skin), and inhalation (breathing).
- Collateral health hazards to humans: Risk of unintended Effects
  - Blunt trauma due to incomplete/improper deceleration
  - Eye injury – CS, Tungsten Powder
  - Skin perforation – CS, Tungsten Powder
  - Inhalation/lungs – Toxicology
  - Other: Heat, Noise

Conceptual Delivery Effects



Legal

Legal Issues: None

- Army JAG preliminary legal review received 06 Jul 01

  •Concludes that the NL Airburst OICW munition concept appears consistent with law obligations of the US, including law of war.

  •Memorandum was coordinated with the Navy JAG and the Staff Judge Advocate to the Commandant of the Marine Corps, who concur with its analysis and conclusions.

"An OICW non-lethal munition poses no new questions with respect to unnecessary suffering."

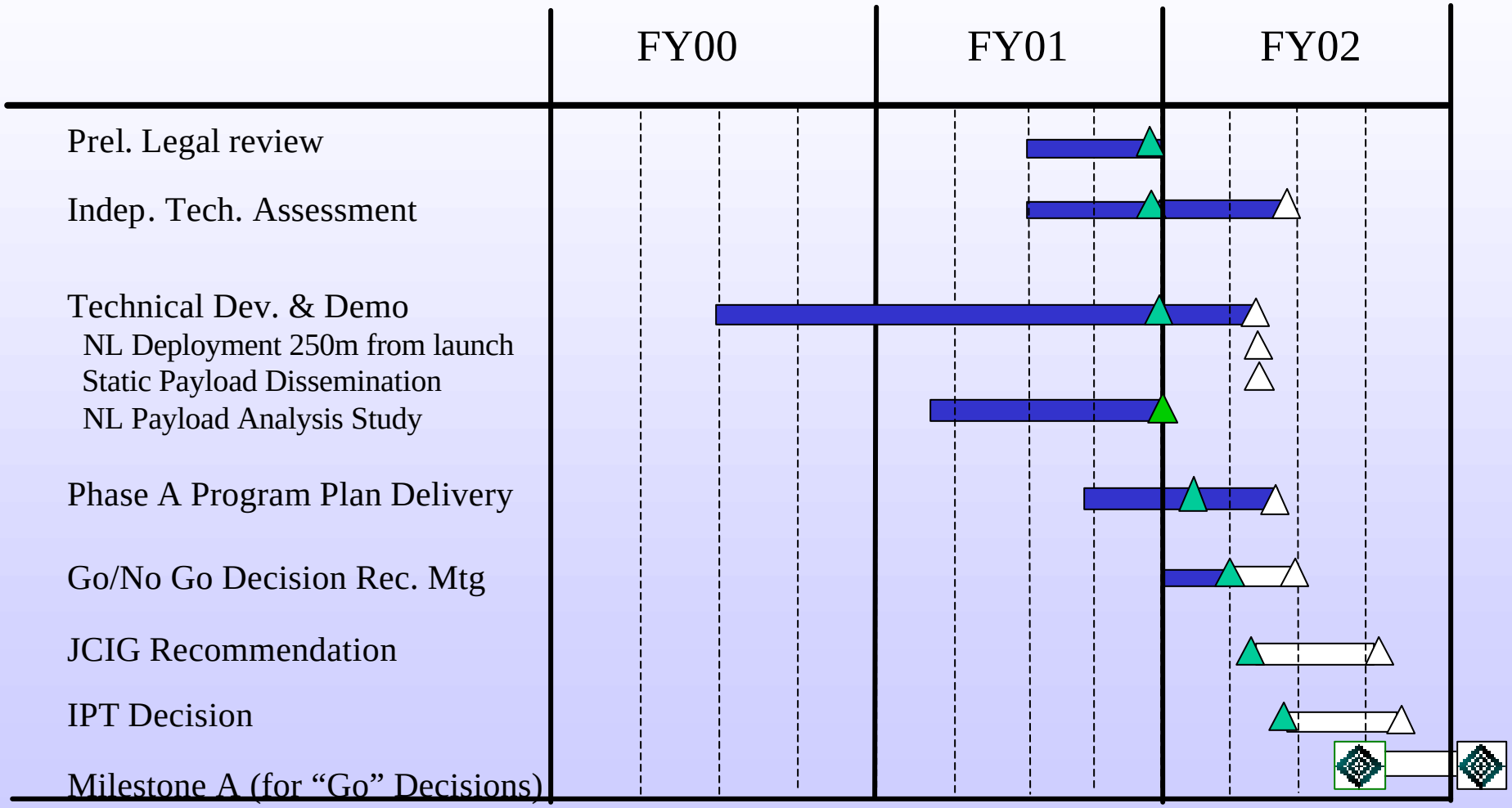
Program Accomplishments

- Favorable Preliminary Legal Review received – Jul 01
- Conducted Technical Demonstration – 12 Feb 02
- Penn St U Independent Technical Review Panel assessed technical feasibility and military worth of the OICW NL munition – 25 Apr 02
- Revisited Chamber test for CS payload effectiveness – 19 Apr 02

Future Plans

- Go/No go Decision meeting – 29 May 02
- Milestone A Decision – 1Q FY03

Pre-MSA Schedule for the OICW NL Munition



OICW System Schedule
Non-Lethal & MEMS S&A Development